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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/593,502	11/09/2007	Guilford Jones II	0079571-0110 (BU04-17 US)	3131
24280 7590 09/28/2009 CHOATE, HALL & STEWART LLP TWO INTERNATIONAL PLACE BOSTON, MA 02110			EXAMINER CHANDRAKUMAR, NIZAL S	
			ART UNIT 1625	PAPER NUMBER
			NOTIFICATION DATE 09/28/2009	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@choate.com

Office Action Summary	Application No. 10/593,502	Applicant(s) JONES LL ET AL.	
	Examiner NIZAL S. CHANDRAKUMAR	Art Unit 1625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08/10/2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5,8,9,17,19-23,30-65 and 79 is/are pending in the application.
- 4a) Of the above claim(s) 55-65 and 79-81 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-5,8, 9, 23, 33 is/are allowed.
- 6) ☒ Claim(s) 17,20-22,30-32,34-39 and 41-53 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>5/25/2007</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Applicant's election with traverse of Group I in the reply filed on 08/10/2009 is acknowledged. The traversal is on the ground(s) that the Examiner has not met his burden of showing a lack of a single inventive concept with regard to claims 1-5, 8-9, 17, 19-23 and 30-54. Applicant therefore request that Groups 2 to 5 be rejoined with elected Group I. While not agreeing with the applicant, upon further consideration subsequent to interview with applicants (see interview summary 09/09/2009), claims 1-5, 8-9, 17, 19-23 and 30-54 are rejoined and examined together.

Further applicants proposed additional groups (encompassing claims drawn to pharmaceutical methods of use of compounds, shown on page 34-36 on applicants Remarks filed 08/10/2009) be added to the Restriction Requirement. This is acknowledged and agreed. Applicant is silent with regards to restriction requirement relating to compound claims and pharmaceutical method of use claims.

The requirement is still deemed proper and is therefore made FINAL.

Claims 55-65 and 79-81 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected inventions, there being no allowable generic or linking claim.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim

Art Unit: 1625

remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 17 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term 'derivative' renders the scope of the claim indefinite. For example dihydrocinnamic acid and cinnamyl alcohol are cinnamate derivatives but one of skill in the art would not anticipate these to participate as dipolarophile (see rejection under 112 scope of enablement).

Replacing the term "derivative" with --ester-- would overcome the above rejection.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 19-22 (and dependent claims 30-32, 34-39, 41-53) rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the cycloaddition of photochemically generated oxidopyrylium species to a dipolarophile,

Art Unit: 1625

that is, to an electron-deficient double bond, does not reasonably provide enablement for double bonds that is not activated (by electron withdrawing groups). Further, it is not seen where in the specification the acyloin rearrangement leading to compounds of formula VII is enabled when the variable Ra is not an electron withdrawing ester functionality. The rejection of the claims relating to 'cycloaddition' and 'acyloin rearrangement' are not separately presented in this office action as the basis for the rejection is the same (see below) and pertains to variable Ra. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims. The determination that "undue experimentation" would have been needed to make and use the claimed invention is not a single, simple factual determination. Rather, it is a conclusion reached by weighing all the relevant factual considerations.

Enablement is considered in view of the Wands factors (MPEP 2164.01 (a)). These include: (1) breadth of the claims; (2) nature of the invention; (3) state of the prior art; (4) amount of direction provided by the inventor; (5) the level of predictability in the art; (6) the existence of working examples; (7) quantity of experimentation needed to make or use the invention based on the content of the disclosure; and (8) relative skill in the art.

All of the factors have been considered with regard to the claims, with the most relevant factors discussed below:

The invention is drawn to a method of generating an oxidopyrylium species

Art Unit: 1625

and performing a cycloaddition reaction between the oxidopyrylium species and a dipolarophile to form a cycloadduct which could further be transformed using acyloin rearrangement.

Cycloaddition: Claims are drawn to cycloadditions of generically defined dipolarophile $RaHC=CHRb$ wherein the possibilities for groups Ra and Rb include neutral (for example H), electron withdrawing (for example ester) and electron donating (for example alkoxy) functionalities. The chemistry direction provided in the specification for performing the claimed cycloaddition is limited to dipolarophiles wherein Ra or Rb is an ester group. That is, the disclosed cycloaddition is limited to electron-deficient double bonds. This is consistent with art recognized concepts of cycloaddition mechanisms. There is nothing in the specification where a 1,3-dipole (that is an oxidopyrylium species containing positive and negative ends) generated as instantly claimed could be cycloadded to an unpolarized unsaturated system. While it is well-known that thermally generated oxidopyrylium species reacts with electron-rich, neutral or electron-poor olefins, there is no teaching in the specification the same situation is obtainable with photochemically generated oxidopyrylium species. The specification is silent with respect to prior art citations relating to cycloaddition of photochemically generated oxidopyrylium species to neutral or electron rich double bonds. Note that applicant had argued that the instant oxidopyrylium species is different from the thermally generated oxidopyrylium species. See Applicants Remarks filed 08/10/2009, page 32 of 59, last paragraph.

Acyloin Rearrangement:

Art Unit: 1625

The lack of enabling disclosure with respect to the rearrangement, that is, the transformation of compounds of formula VI to compounds of formula VII also relates, ultimately, to the substituents on the dipolarophile $RaHC=CHRb$. There is no direction, guidance or working example in the specification for this transformation when Ra of VI is other than an ester moiety. Further, the limited disclosure provided establishes that enolate formation is necessary for the ketol shift, that is conversion of VI to VII, such that the transformation can be performed only under basic conditions (See specification page 32 of 83). This observation in turn limits the viable possibility for Ra to an electron withdrawing functionality because only such a group would enable deprotonation and formation of enolate.

Similar considerations with regards to other variables on the dipolarophile $RaHC=CHRb$ indicate that undue experiment would be required to arrive at conditions to perform the cycloaddition as claimed and further convert the adduct VI to VII as instantly claimed. The unpredictability in organic synthesis is high in spite of the high skill level in the area. The state of the art of organic chemical synthesis is closer to what is described by Dorwald et al. who states, "Most non-chemists would probably be horrified if they were to learn how many attempted syntheses fail, and how inefficient research chemists are. The ratio of successful to unsuccessful chemical experiments in a normal research laboratory is far below unity, and synthetic research chemists, in the same way as most scientists, spend most of their time working out what went wrong, and why. ...Chemists tend not to publish negative results, because these are, as opposed to positive results, never definite (and far too copious) [preface].....Small

Art Unit: 1625

structural variations of polyfunctional substrates might, therefore, bring about an unforeseeable change in reactivity [pg. 9].....” Dorwald F. A. Side Reactions in Organic Synthesis, 2005, Wiley: VCH, Weinheim pg. IX of Preface pg. 1-15.

The existence of such unpredictabilities and limitations would prevent one of ordinary skill in the art from accepting the disclosed cycloaddition and acyloin rearrangement for one set of variables on its face as universally applicable to all possibilities of Ra and Rb.

The claims are not commensurate in scope with the breadth of enablement in as much as the working example in the application is limited to Ra being an ester compared to the wide breadth of the claims, the unpredictability of the art, the high quantity of experimentation needed to make and use the compounds of the instant claims.

Limiting the possibilities of the variables in $RaHC=CHRb$ such that Ra is an ester moiety would overcome the above rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NIZAL S. CHANDRAKUMAR whose telephone number is (571)272-6202. The examiner can normally be reached on 8.30 AM - 4.30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Janet Andres can be reached on 571 0272-0867. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1625

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nizal S Chandrakumar/
Examiner, Art Unit 1625